



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/973,719	10/11/2001	Nozomu Takano	P21547	5759

7055 7590 11/21/2002

GREENBLUM & BERNSTEIN, P.L.C.
1941 ROLAND CLARKE PLACE
RESTON, VA 20191

EXAMINER

FEELY, MICHAEL J

ART UNIT	PAPER NUMBER
----------	--------------

1712

DATE MAILED: 11/21/2002

6

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application N .

09/973,719

Applicant(s)

TAKANO ET AL.

Examiner

Michael J Feely

Art Unit

1712

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 October 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☒ Claim(s) 11 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 3,4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Claim Objections

2. Claim 11 is objected to because of the following informalities: the word "lease" should be replaced with –least–. Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. Claims 1-19 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
4. While applicant may be his or her own lexicographer, a term in a claim may not be given a meaning repugnant to the usual meaning of that term. See *In re Hill*, 161 F.2d 367, 73 USPQ 482 (CCPA 1947). The term "oligomer" in claims 1-19 is used by the claim to mean "a polymer having a degree of polymerization in the range of 2 to 7000," while the accepted meaning is "a polymer comprising 2, 3, or 4 monomer units." – *Hackh's Chemical Dictionary*, Fourth Edition, 1969. It is unclear if the invention comprises a silicone oligomer, or a silicone polymer having a degree of polymerization of 2 to 7000. For the purpose of examination, the term "silicone oligomer" has been interpreted to mean a silicone polymer having a degree of polymerization of 2 to 7000.

Art Unit: 1712

Specification

5. The disclosure is objected to because of the following informalities: Applicants define an oligomer as a polymer having a degree of polymerization in the range of 2 to 7000 (page 5, lines 18-20), while the accepted meaning of "oligomer" is a polymer comprising 2, 3, or 4 monomer units. It is unclear if the invention comprises a silicone oligomer, or a silicone polymer having a degree of polymerization of 2 to 7000.

Appropriate correction is required.

Claim Rejections - 35 USC § 102/103

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language;

or

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the

Art Unit: 1712

reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1, 4-6, and 8-10 are rejected under 35 U.S.C. 102(e)(2) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Furukawa et al. (US Pat. No. 6,303,681).

Regarding claims 1 and 9, Furukawa et al. disclose an incombustible resin composition (Abstract), which comprises a silicone oligomer (Abstract; column 4, lines 23-27), a metal hydrate (Abstract; column 3, lines 1-16), and a resin material (Abstract; column 2, lines 41-67) as essential components, wherein the metal hydrate is 20% by weight or more in the total solids of the resin composition (column 4, lines 28-34). Furukawa et al. do not explicitly disclose that silicone oligomer has a degree of polymerization in the range of 2 to 7000; however, Furukawa et al. disclose, "The weight-average molecular weight of component (C) should as a general matter be 300 to 500,000 and preferably is 300 to 100,000 and more preferably is 300 to 10,000," (column 4, lines 23-27). This weight-average molecular weight range would have inherently overlapped with claimed range of degree of polymerization.

Therefore, if not explicitly disclosed in the reference, then the teaching would have been obvious to one of ordinary skill in the art at the time of the invention.

Regarding claims 4-6 and 8-10, Furukawa et al. disclose the composition of claim 1, wherein (4) the metal hydroxide includes aluminum hydroxide (column 3, lines 10-16); (5)

Art Unit: 1712

wherein the aluminum hydroxide has an average particle diameter of 5 μm or less (column 3, lines 6-10); **(6)** wherein the metal hydrate includes magnesium hydroxide (column 3, lines 10-16); **(8)** wherein an end of the silicone oligomer has a silanol group capable of reacting with the surface of a metal hydrate (column 3, lines 35-38, 54-58; column 4, lines 4-11); and **(10)** wherein the silicone oligomer has an aromatic group (column 3, lines 38-47).

9. Claims 1-5, 8-10, 12-19 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Takano et al. (WO 97/01595) and Takano et al. (US 2001/0053447 A1). Because the US Publication is a National Stage Application of the International Application, it is being used as a translation document for the International Application. All citations are drawn to the US Publication.

Regarding claims 1-5, and 8-10, Takano et al. disclose **(1)** a resin composition (paragraph 0084), which comprises a silicone oligomer (paragraph 0085), a metal hydrate (paragraphs 0087 and 0043), and a resin material (paragraph 0085) as essential components, wherein the metal hydrate is 20% by weight or more of the total solids of the resin composition (paragraphs 0087 and 0043); **(2)** wherein a resin material is selected from the group consisting of an epoxy resin, a polyimide resin, a triazine resin, a phenol resin, melamine resin, and denatured resins denaturing these resins (paragraphs 0091 and 0039); **(3)** wherein the metal hydrate has surface processed with a silicone oligomer (paragraph 0085); **(4)** wherein the metal hydrate includes aluminum hydroxide (paragraphs 0087 and 0043); **(5)** wherein the aluminum hydroxide has an average particle diameter of 5 μm or less (paragraphs 0087 and 0043); **(8)** wherein an end of the silicone oligomer has a silanol group capable of reacting with the surface of a metal hydrate (paragraph 0085); **(9)** wherein the degree of polymerization of the silicone oligomer is in the range of 2 to

Art Unit: 1712

7000 (paragraph 0085); and **(10)** wherein the silicone oligomer has an aromatic group (paragraphs 0085 and 0031). Takano et al. do not explicitly disclose that the composition is incombustible; however, this would have been an inherent property of the composition because it has been found a chemical composition and its properties are inseparable – *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658.

Therefore, if not explicitly taught in the reference, then the teaching would have been obvious to one of ordinary skill in the art at the time of the invention.

Regarding claims 12-16 and 19, Takano et al. disclose **(12)** a prepreg manufactured by using the resin composition of claim 1 (paragraphs 0096 and 0097); **(13)** a laminated plate manufactured by using the prepreg according to claim 12 (paragraphs 0096 and 0097); **(14)** a metal-clad laminated plate manufactured by using the prepreg according to claim 12 (paragraphs 0096 and 0097); **(15)** a printed wiring board prepared by using the laminated plate according to claim 13 (paragraphs 0096 and 0097); **(16)** a multi-layer printed wiring board prepared by using the prepreg according to claim 12 (paragraphs 0096, 0097, and 0100); and **(19)** a printed wiring board prepared by using the metal-clad laminated plate according to claim 14 (paragraphs 0096, 0097, and 0100).

Therefore, if not explicitly taught in the reference, then the teaching would have been obvious to one of ordinary skill in the art at the time of the invention.

Regarding claims 17 and 18, Takano et al. disclose a **(17)** method for preparing a resin composition (paragraphs 0084 and 0085), which comprises: blending a metal hydrate (paragraphs 0087 and 0043) with a processing liquid containing silicone oligomer (paragraphs 0088 and 0085), and then blending other resin components (paragraph 0085); and **(18)** wherein

Art Unit: 1712

the metal hydrate includes aluminum hydroxide (paragraphs 0087 and 0043). Takano et al. do not explicitly disclose that the composition is incombustible; however, this would have been an inherent property of the composition because it has been found a chemical composition and its properties are inseparable – *In re Spada*, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658.

Therefore, if not explicitly taught in the reference, then the teaching would have been obvious to one of ordinary skill in the art at the time of the invention.

Claim Rejections - 35 USC § 102

10. Claims 1, 4-7, and 9 are rejected under 35 U.S.C. 102(e)(2) as being anticipated by Yamamoto (US Pat. No. 6,277,908).

Regarding claims 1, 4-7, and 9, Yamamoto discloses **(1)** an incombustible resin composition (Abstract), which comprises a silicone oligomer (Abstract; column 4, lines 4-22), a metal hydrate (Abstract; column 4, lines 23-48), and resin material (Abstract) as essential components, wherein the metal hydrate is 20% by weight or more in the total solids of the resin composition (Abstract; column 4, lines 39-48); **(4)** wherein the metal hydrate includes aluminum hydroxide (column 4, lines 34-38); **(5)** wherein the aluminum hydroxide has an average particle diameter of 5 μm or less (column 4, lines 26-28); **(6)** wherein the metal hydrate includes magnesium hydroxide (column 4, lines 34-38); **(7)** wherein the metal hydrate includes calcium hydroxide (column 4, lines 34-38); and **(9)** wherein the degree of polymerization of the silicone oligomer is in the range of 2 to 7000 (column 4, lines 17-22).

Claim Rejections - 35 USC § 103

11. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Furukawa et al. (US Pat. No. 6,303,681).

Art Unit: 1712

Regarding claim 11, Furukawa et al. do not explicitly disclose the composition of claim 1, wherein each siloxane unit of the silicone oligomer has at least one aromatic group respectively. Furukawa et al. disclose, "R in $R_nSiO_{(4-n)/2}$ and $RSiO_{3/2}$ is selected from the group consisting of monovalent organic groups selected from the group consisting of C_1 to C_{12} alkyl and C_6 to C_{12} aryl and hydroxyl group," (column 3, lines 35-38) wherein, "the C_6 to C_{12} aryl can be exemplified by phenyl, naphthyl, and tolyl," (column 3, lines 40-41). Furukawa et al. further disclose, "It is essential that aryl constitute from 50 to 100 mole% of the total monovalent organic groups in component (C)," and, "An aryl content below 50 mole % results in a reduced flame retardency for the present composition," (column 3, lines 48-53). Although not explicitly taught, it would have been within the scope of the reference to use a silicone compound having 50 to 100 mole % of the total monovalent organic groups being phenyl radicals.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to have provided each siloxane unit of the silicone oligomer with at least one aromatic group in the invention of Furukawa et al. because Furukawa et al. teach that it is essential that aryl, which is exemplified by phenyl, constitute from 50 to 100 mole% of the total monovalent organic groups in the silicone; resulting in enhanced flame retardency of the overall composition.

12. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takano et al. Takano et al. (WO 97/01595) and Takano et al. (US 2001/0053447 A1). Because the US Publication is a National Stage Application of the International Application, it is being used as a translation document for the International Application. All citations are drawn to the US Publication.

Art Unit: 1712

Regarding claim 11, Takano et al. do not explicitly disclose the composition of claim 1, wherein each siloxane unit of the silicone oligomer has at least one aromatic group respectively. Takano et al. disclose, "Preferred silicone oligomers contain at least one kind of siloxane units selected from trifunctional siloxane units ($\text{RSiO}_{3/2}$, R being an organic group, for example, an alkyl group of one or two carbon atoms, such as methyl or ethyl, an aryl group of 6 to 12 carbon atoms, such as phenyl, and vinyl, and the R groups in the silicone oligomer being identical with or different from one another) and tetrafunctional siloxane units ($\text{SiO}_{4/2}$), and, optionally, difunctional siloxane units ($\text{R}_2\text{SiO}_{2/2}$)," (paragraph 0031), wherein, "the preferred silicone oligomers comprise only trifunctional units," (paragraph 0033). Although not explicitly taught, it would have been within the scope of the reference to use a silicone oligomer comprising only trifunctional units, wherein R is always phenyl.

Therefore, if not explicitly taught in the reference, then the teaching would have been obvious to one of ordinary skill in the art at the time of the invention.

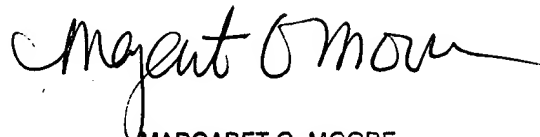
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J Feely whose telephone number is 703-305-0268. The examiner can normally be reached on M-F 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Dawson can be reached on 703-308-2340. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Art Unit: 1712

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

Michael J. Feely
November 17, 2002

A handwritten signature in cursive script, reading "Margaret G. Moore". The signature is written in dark ink and is positioned above the printed name and title.

MARGARET G. MOORE
PRIMARY PATENT EXAMINER
ART UNIT 1712